

NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

## Unit-2 Mastery Assessment (version 614)

### Question 1 (10 points)

Let  $f$  represent a function. If  $f[32] = 13$ , then there exists a knowable solution to the equation below.

$$y = 2 \cdot f[3x + 5] + 14$$

Find the solution.

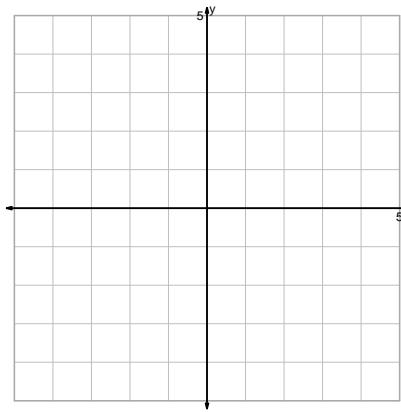
$$x =$$

$$y =$$

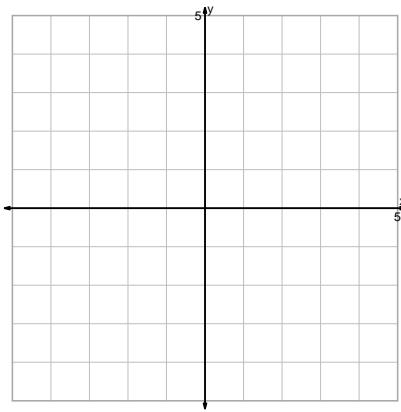
### Question 2 (20 points)

Graph the equations accurately. For each integer-integer point on the parent, indicate the corresponding point precisely. Also, with dashed lines, indicate any asymptotes.

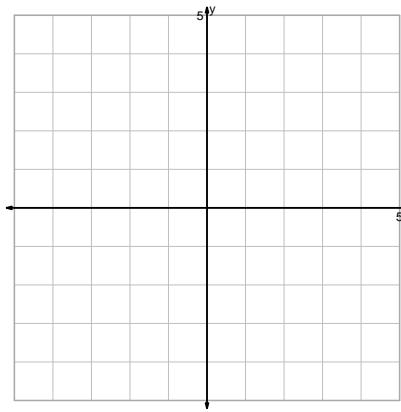
$$y = 2^{2x}$$



$$y = \sqrt{-x}$$



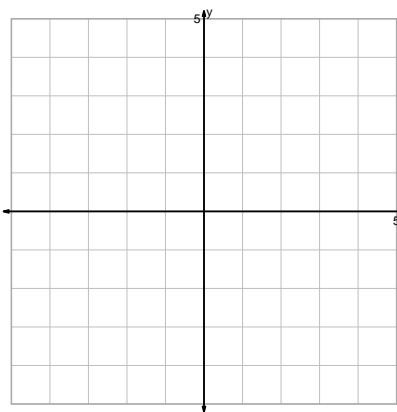
$$y = (x - 2)^3$$



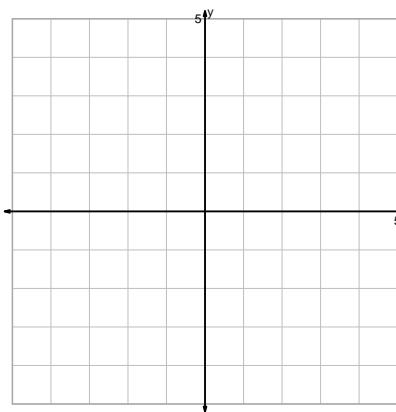
$$y = -2^x$$

Question 2 continued...

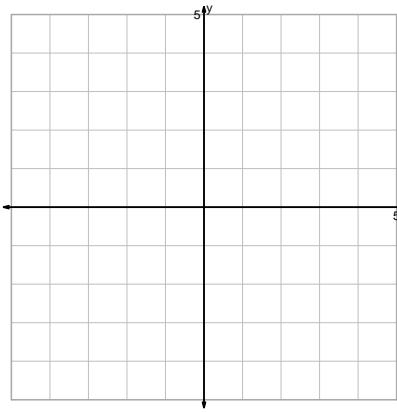
$$y = \sqrt[3]{x} - 2$$



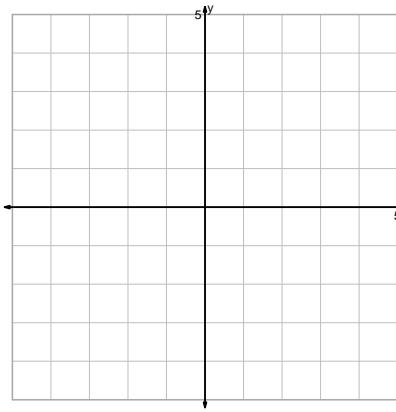
$$y = \left(\frac{x}{2}\right)^3$$



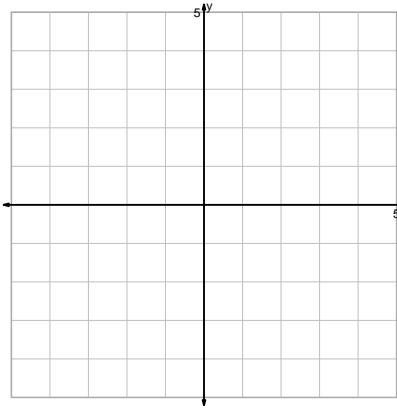
$$y = 2 \cdot \sqrt[3]{x}$$



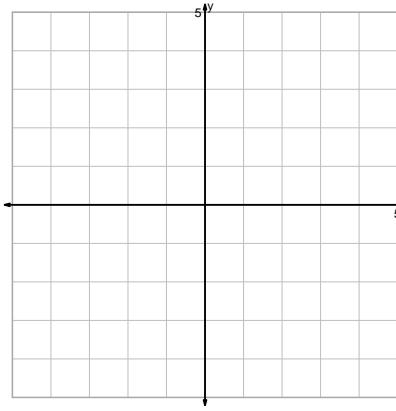
$$y = \sqrt{x} + 2$$



$$y = \frac{\log_2(x)}{2}$$

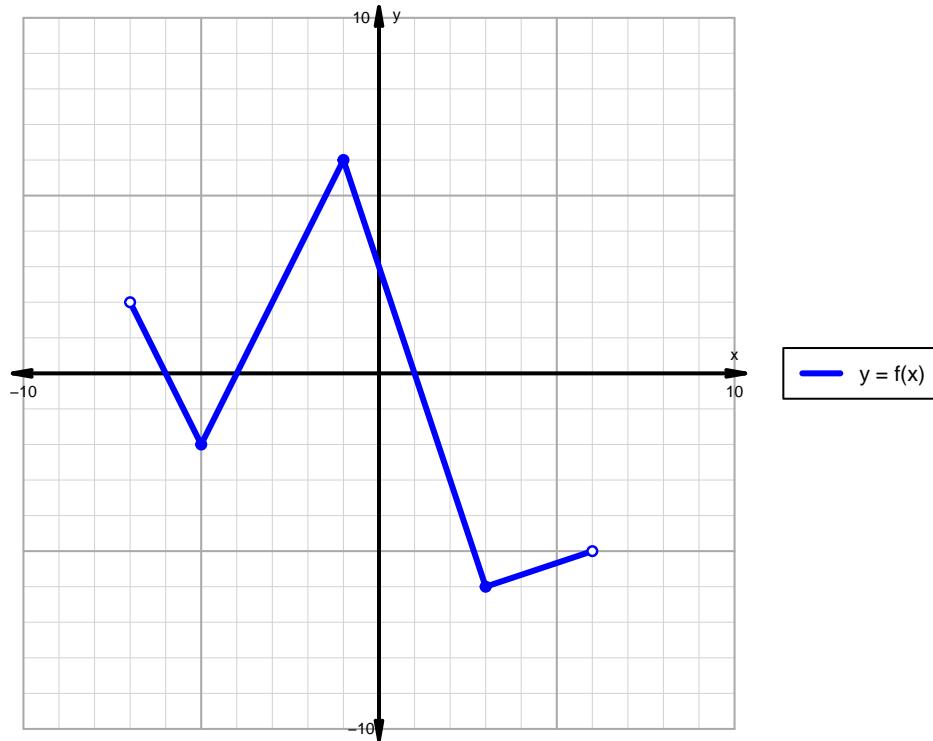


$$y = (x+2)^2$$



**Question 3 (20 points)**

A function is graphed below.



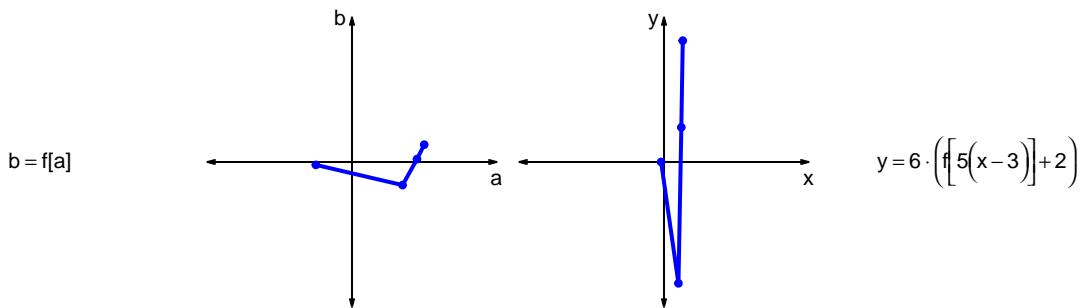
Indicate the following intervals using interval notation.

Feature	Where
Positive	
Negative	
Increasing	
Decreasing	
Domain	
Range	

#### Question 4 (20 points)

Let  $f$  represent a function. The curves  $b = f[a]$  and  $y = 6 \cdot (f[5(x - 3)] + 2)$  are represented below in a table and on graphs.

a	b	x	y
-25	-2	-2	0
35	-16	10	-84
45	2	12	24
50	12	13	84



- a. Write formulas for calculating  $x$  from  $a$  and calculating  $y$  from  $b$ . (Or, write the coordinate transformation formula.)

b. What geometric transformations (using words like translation, stretch, and shrink), and in what order, would transform the first curve  $y = f[x]$  into the second curve  $y = 6 \cdot (f[5(x - 3)] + 2)$ ?

**Question 5 (10 points)**

A parent square-root function is transformed in the following ways:

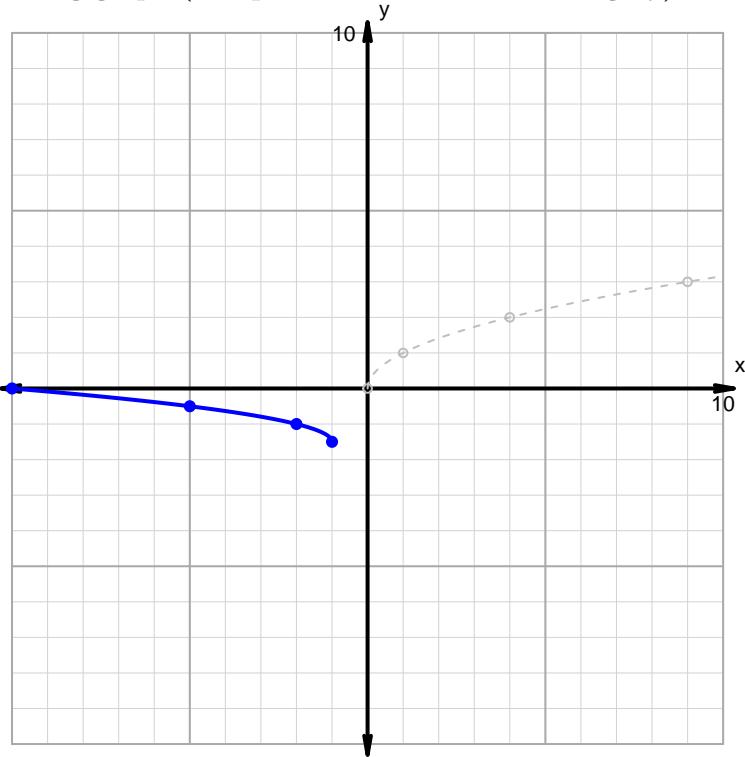
**Horizontal transformations**

1. Translate right by distance 1.
2. Horizontal reflection over  $y$  axis.

**Vertical transformations**

1. Translate down by distance 3.
2. Vertical shrink by factor 2.

Resulting graph (and parent function in dashed grey):



- What is the equation for the curve shown above?

**Question 6 (20 points)**

Make an accurate graph, and describe locations of features.

$$y = -3 \cdot |x - 4| + 9$$



Feature	Where
Domain	
Range	
Positive	
Negative	
Increasing	
Decreasing	